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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,891	07/16/2003	Masataka Ito	273855US90	1485

22850 7590 09/06/2006

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EXAMINER

PEACE, RHONDA S

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 09/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/621,891	Applicant(s) ITO ET AL.	
	Examiner Rhonda S. Peace	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-60 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/8/2005</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 11/8/2005 was filed in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

The disclosure is objected to because of the following informalities: There is no brief description of Figure 6D. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 8, 32, 38, and 55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4, 8, 32, 38, and 55 recite the limitation "said substrate." There is insufficient antecedent basis for this limitation in the claim. It is assumed, for examination purposes, that the Applicants intend "said substrate" to recite "said submount."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

*Claims 1-7, 9-13, 16-21, 24*32, 35-40, and 44-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakii et al (US 5764833) in view of Nakanishi et al (US 6655856).*

Regarding claims 1, 10, and 44, Kakii et al discloses an optoelectronic communication module comprising the following:

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- Optical fibers **1** terminating in facets on an end face of an optical block **F** (column 12 lines 6-18, hereafter indicated in the form 12:6-18, Fig 20).
- A module **31** joined to the end face of block **F**, where the module **31** contains laser diode **33** (12:6-18, Fig 20).

With regard to the module 31, Kakii et al does not disclose in any lengthy detail the specific construction of the module, and instead describes the module as conventional. Therefore, Kakii et al does not disclose bonding the laser to the submount, the inclusion of driver circuits, the inclusion of a cap that encloses the laser and fiber facets.

Continuing with claims 1, 10, and 44, Nakanishi et al discloses an optical module having a laser diode **30** and associated driver circuits **31** bonded to a submount **27** that is topped by cap **37** (9:1-15 and 24-31, Fig 3). In Figures 10-17, Nakanishi et al shows various embodiments of the submount **27** in combination with the cap **37**. As it has been held that forming in one piece an article formerly formed in two pieces (*Howard v. Detroit Stove Works*, 150 U.S. 164 (1893)), as well as forming a formerly integral structure in various elements (*Nerwin v. Erlichman*, 168 USPQ 177, 179), involves only routine skill in the art and is within one of ordinary skill in the art, it becomes apparent that a wide range of variations for the fitting of a cap to a submount is obvious in view of Nakanishi et al. For example, an obvious variant of the embodiment shown in Figure 11 of Nakanishi et al would be an encasement where submount **75** does not include the enclosing side walls **25** (as is seen in Figure 13), and the enclosing side walls **25** of Figure 14 are made integral with the cap **37**, thereby forming a flat submount having a U-shaped cap fitted thereon. This orientation would allow the cap **37** (with sidewalls **25**)

to contact and be fixed to both the fiber **34**, as well as the submount portion **75**, and fully enclose the fiber's (**34**) end face and the laser diode **30**.

In conclusion with respect to claims 1, 10, and 44, it would have been obvious to one of ordinary skill in the art to combine module encasing structure (or any obvious variant thereof) with the overall coupling structure taught by Kakii et al, as the module of Nakanishi et al provides an excellent seal against environmental contaminants, allows the use of silicone resin in a more accurate fashion, which is advantageous, as the proper use of silicone resin allows for the elimination of previously required elements, such as lenses, and therefore allows the module to be produced at a minimized size and reduced cost (Nakanishi et al 1:64-67, 2:1-15, 3:4-15, 4:30-37, 5:7-26).

With respect to claims 2, 5-7, 9, 13, 16, 17, 45, 46 and 50, Kakii et al, in view of Nakanishi et al, discloses the optical system as described above. To further elaborate on the teachings of Nakanishi et al, resins **35** and **36** are used to fill the enclosure formed by the submount and cap, and provide to bond the fiber array, cap, and submount to one another, thereby hermetically sealing the enclosure. The laser **30** and fiber facets are encapsulated by silicone resin **30**, which is substantially transparent to light waves passing between the fiber and the laser. Resin **36** is used to provide a hard outer covering to resin **35**, and bonds the fiber to the submount and cap (5:7-11, 9:24-31, Fig 3).

Concerning claims 3, 4, 11, 12, 47-49, and 51-53, Kakii et al, in view of Nakanishi et al, discloses the optical system as described above. As previously discussed, several variations of the embodiments shown in Figures 10-17 of Nakanishi et al are

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considered obvious to one of ordinary skill in the art. For example and referring to Figure 15 of Nakanishi et al, the submount may contain the plate **75** and a portion of the left-most side wall **25**, while the cap contains upper plate **37**, a portion of the left-most side wall **25**, as well as all of right-most the side wall **25** as a unitary cap piece.

Moreover, sidewalls **25** may be separated from the submount **75**.

With regard to claims 18, 20, 25, 31, and 54, Kakii et al, in view of Nakanishi et al disclose the optical system as disclosed above, and further disclose a method of forming such an optical system comprising:

- Providing an optical fiber block **F** supporting a plurality of fibers **1** each terminating in a face on an end face of the block **F** (Kakii et al: 12:6-18, Fig 20).
- Bonding block **F** to an optical module **M** along the fiber facet (Kakii et al 12:6-18, Fig 20).

As discussed above, it would be obvious to one of ordinary skill in the art to use the module of Nakanishi et al in place of the module **M** shown in Figure 20.

Correspondingly, Nakanishi et al specifically discloses the method of forming the following:

- Providing a submount **75** (7:38-43, Fig 15).
- Bonding laser diode **30** to the submount **75** (Fig 5, 9:12-13).
- Affixing a containment dam having sidewall portions **25** and cap portion **37** to submount **75** for defining a fluid containment enclosure that encompasses the laser **30** (9:24-31 and 58-63, Fig 3).

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- Optically aligning the submount **37**, containment dam **25** and **37**, and laser **30** with a fiber **34** (Fig 3).
- Applying a liquid resin **35** and **36** to encapsulate the laser **30** (9:24-32, Fig 3), and thereby bond the containment dam and submount to the fiber **34**.

Pertaining to claims 21, 24, 29, 32, 35-40, and 55-60, as it has been held that forming in one piece an article formerly formed in two pieces (*Howard v. Detroit Stove Works*, 150 U.S. 164 (1893)), as well as forming a formerly integral structure in various elements (*Nerwin v. Erlichman*, 168 USPQ 177, 179), involves only routine skill in the art and is within one of ordinary skill in the art, it becomes apparent that a wide range of variations for the fitting of a cap to a submount is obvious in view of Nakanishi et al. For example, an obvious variants of the module disclosed by Nakanishi et al would include the following (which are explained with reference to Figure 15):

- A system having a submount **75**, and a cap mounted thereon comprising three side walls **25** and a top portion **37**. As Nakanishi et al discloses the cap **37** may be bonded to the structure of Figure 15 (11:35), it would be obvious to one of ordinary skill in the art to bond the modified cap structure explained herein to its underlying submount.
- A system having a submount **75** and a cap mounted thereon having a separate top portion **37** and three side walls **25**, where the open end of the resulting structure is fitted with the fiber block, where the side walls are

assembled first with the underlying submount (Fig 14), and the top portion **37** is then affixed atop the side walls **25** (Fig 15).

- A system having a submount **75** with side walls **25** extending upward to a point where the fiber **34** is introduced, and a cap structure having a top portion **37** and side wall portions **25** extending downward from the top portion **37**, such that the side wall **25** of the submount **75** is adhered to the end face of the fiber block.
- A system as discussed immediately above where the top portion **37** is separate from cap structure, where the top portion **37** is affixed to the side walls **25** to create the containment dam.
- A system where the side wall **25** closest to the fiber serves as a spacer separate from the submount **75**, such that one surface of the spacer is bonded to the submount **75**, and the opposing side is bonded to the fiber block.
- A system where the side walls **75**, base **75**, and cap **37** forms a closed perimeter spacer placed around submount **26**.

Concerning claims 19, 26-28, and 30, Kakii et al, in view of Nakanishi et al, disclose the optical system and associated method as described above. As before, resins **35** and **36** are used to fill the enclosure formed by the submount and cap, and provide to bond the fiber array, cap, and submount to one another, thereby hermetically sealing the enclosure. The laser **30** and fiber facets are encapsulated by silicone resin **30**, which is substantially transparent to light waves passing between the fiber and the

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laser. Resin 36 is used to provide a hard outer covering to resin 35, and bonds the fiber to the submount and cap (5:7-11, 9:24-31, Fig 3). Moreover, the alignment process requires the fixing of the submount to the fiber block, as the resin is poured upon placement of the fiber relative to the laser, and it is the pouring of the resin that constitutes the alignment process (4:66-67, 5:1-6).

Claims 8, 14, 15, 22, 23, 33, 34, 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakii et al (US 5764833), in further view of Nakanishi et al (US 6655856), in further view of Porter et al (US 2004/0228601).

Pertaining to claims 8, 14, 15, 22, 23, 33, 34, 41-43, Kakii et al, in view of Nakanishi et al, discloses the optical system and associated method as described above. However, neither discloses an injection hole for injecting the resin into the chamber, thereby allowing the placement of resin to be the last step in the manufacturing process. Porter et al discloses a hole 36 for injecting resin into a chamber 37 (paragraph 0100, Fig 1). It would have been obvious to one of ordinary skill in the art to combine the teachings cited above with those of Porter et al, as this allows the precise placement of the resin within the chamber (Porter et al: 0100). It would be obvious to one of ordinary skill in the art to place the hole through the cap of the module or through a side wall of the module, as this provides the easiest access for the user to administer the liquid resin via needle.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kuhara et al (US 2002/0037143), Goto (US 6075911), Terada et al (US 6269209), Okada et al (US 6435734), Sotokawa et al (US 6554491), and Murata et al (US 6793405) each disclose optical modules where a laser diode and/or photodiode is encased in optically transparent resin.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rhonda S. Peace whose telephone number is (571) 272-8580. The examiner can normally be reached on M-F (8-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272- 2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

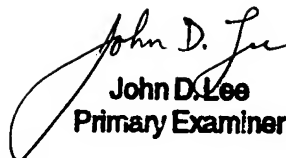
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A handwritten signature in black ink, appearing to read "Rhonda S. Peace". The signature is fluid and cursive, with the first name being the most prominent.

Rhonda S. Peace

Examiner

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A handwritten signature in black ink, appearing to read "John D. Lee". The signature is cursive and stylized, with a large loop at the beginning.

John D. Lee

Primary Examiner